

EXECUTIVE SUMMARY

The Department of Toxic Substances Control (DTSC) has prepared this Removal Action Plan (Cleanup Plan)¹ for this phase of cleanup of lead-impacted soil in communities surrounding the former Exide Technologies, Inc. (Exide) Battery Recycling Facility, located in Vernon, California, also known as the Preliminary Investigation Area (PIA). This Cleanup Plan is the latest and most significant step that DTSC has taken to protect the people who live in the communities around the former Exide Facility, especially sensitive individuals, including children and pregnant women.

DTSC has worked with and listened to the public in affected communities, local and federal government officials, public health officials, cleanup experts for other lead-impacted residential properties located across the country, and others in implementing protections for people in these communities. DTSC used its experience, legal authorities, and input from the public and others in rejecting a permit for the Exide Facility and ordering the facility to close, and in ordering Exide to sample soil for contamination in communities around its facility, and to clean up residential areas closest to its facility. DTSC has ensured that hundreds of sensitive land use properties (i.e., residences, schools, parks, day care centers, and child care facilities) have already been cleaned up and, as of June 30, 2017, approximately 9,000 sensitive land use properties within the PIA have been sampled for lead and other heavy metals. DTSC will use the \$176.6 million loan of state funds requested by Governor Edmund G. Brown, Jr. and authorized by legislation to move this Cleanup Plan forward. This Cleanup Plan represents the next step in cleaning up lead-impacted soil at sensitive land use properties around the former Exide Facility.

This Cleanup Plan summarizes soil sampling results from sensitive land use properties within the PIA, describes cleanup objectives, identifies and reviews potential cleanup technologies, evaluates cleanup alternatives, and identifies the preferred cleanup alternative for the cleanup of lead-contaminated soil at sensitive land use properties within the PIA. After considering all comments received, DTSC has selected and will implement the preferred cleanup alternative in a manner consistent with the criteria in Subpart E of the National Oil and Hazardous Substances Pollution Contingency Plan (40 C.F.R. Part 300), as amended (the National Contingency Plan or NCP), and the U.S. Environmental Protection Agency (USEPA) Superfund Lead-Contaminated Residential Site Handbook.

This Cleanup Plan presents an evaluation of cleanup alternatives consistent with USEPA's *Interim Final, Guidance for Conducting Remedial Investigations and Feasibility Studies under Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) (USEPA, 1988) and the guidelines contained in the *Proven Technologies and Remedies (PT&R) Guidance for Remediation of Metals in Soil* (DTSC, 2008). This Cleanup Plan describes the selected cleanup alternative and includes a conceptual design applicable to sensitive land use properties in the PIA.

¹ This plan was previously referred to as the Remedial Action (Cleanup) Plan. For an explanation of the name change, see Final Environmental Impact Report, Section 2.2 *Master Responses to Comments* (Master Response 1). (Appendix L.)

A lead recycling facility operated at the former Exide Facility property from 1922 until March 2014. Exide acquired the facility in 2000 and used the facility for lead recycling to recover lead from automotive batteries and other lead-bearing materials. In March 2014, Exide shut down its operations because it could not meet new rules enacted by the South Coast Air Quality Management District (SCAQMD), and has not operated since that date. According to the Revised AB 2588 Health Risk Assessment prepared for Exide in January 2013, Exide had intended to implement air pollution risk reduction measures required by SCAQMD and DTSC to restart operations at the facility in March 2015, but in January 2015, DTSC determined that the liner system under the containment building where Exide stored crushed battery feed material had failed. On January 30, 2015, DTSC ordered Exide to investigate the extent of contamination under the containment building so that Exide could implement any necessary corrective actions.

In February 2015, DTSC initiated the process of denying Exide's permit application. After a detailed review of the Exide's record and its Part B hazardous waste permit application, DTSC notified Exide that the facility could not operate in compliance with California's safeguards to protect public health and the environment. In March 2015, DTSC notified Exide that DTSC intended to deny Exide's Part B hazardous waste permit application and ordered Exide to withdraw its permit application, permanently cease operations, and close the facility in accordance with a DTSC-approved closure plan.

Activities conducted at the former Exide Facility that may have contributed to contamination of offsite properties within the PIA include battery breaking, smelting, refining lead, and storage, handling, and transportation of batteries, finished lead product, and other materials associated with lead recycling operations. These activities, which occurred for decades before environmental statutes or regulations existed and therefore were carried out without proper environmental control measures, may have contributed to releases of lead within the PIA.

In response to findings in a risk assessment prepared by Exide for SCAQMD, DTSC ordered Exide to conduct soil sampling in communities around the facility. The initial phase (Phase 1) assessment of lead concentrations in residential soil focused on two areas, collectively referred to as the "Initial Assessment Areas." DTSC ordered Exide to sample 19 residential properties in the Northern Initial Assessment Area (located in Boyle Heights and East Los Angeles) and 20 residential properties in the Southern Initial Assessment Area (located in Maywood) between August and November 2014. Concurrently with Phase 1 sampling, Exide conducted a preliminary background study in a residential area with similar urban and industrial characteristics as those around the former Exide Facility, approximately 14 miles to the south of the facility in Long Beach, California. Exide's study indicated that background lead concentrations in soil were below DTSC's screening level for lead in residential soils (80 milligrams per kilogram (mg/kg) or parts per million (ppm)).

Because the Phase 1 soil sampling results from the Initial Assessment Areas exceeded background lead concentrations and DTSC's screening level for lead in residential soils, DTSC ordered Exide to perform soil cleanup of all residential properties with concentrations exceeding the residential screening criteria

for lead in soils within the Initial Assessment Areas.² Under that order, Exide cleaned up 186 residential properties in the Initial Assessment Areas between August 2014 and November 2015.

DTSC also ordered Exide to conduct additional step-out sampling (Phase 2) within areas referred to as the Northern Expanded Assessment Area and Southern Expanded Assessment Area (collectively referred to as the “Expanded Assessment Areas”). In March 2014, Exide collected soil samples from 146 residential properties in the Expanded Assessment Areas. Many of the properties sampled during Phase 2 exceeded DTSC’s screening level for lead in residential soils. DTSC ordered further sampling along dominant wind directions out to a distance of 4.5 miles from the former Exide Facility.

In April 2015, DTSC received Exide’s final report of its sampling activities. After performing additional analysis of the samples and a thorough statistical review of the results, DTSC concluded that lead from Exide’s operations may have extended as far as 1.3 to 1.7 miles from the facility, depending on direction. In August 2015, Governor Edmund G. Brown, Jr. directed \$7 million in emergency funding to DTSC to implement Phase 3 assessment and cleanup, which included:

- Sampling up to 1,500 residential properties, parks, schools, day care centers, and child care facilities in communities surrounding the former Exide Facility;
- Developing a comprehensive cleanup plan; and
- Beginning cleanup of 50 of the highest priority properties based on the extent of lead contamination and the potential for exposure.

On November 12, 2015, DTSC issued an Imminent and Substantial Endangerment Determination (ISE) for the PIA, which is predominantly a residential area, based on elevated lead concentrations in surface soils in the PIA (Docket No. HAS-FY 15/16-054). From October 2015 through July 2016, DTSC cleaned up residential properties around the former Exide Facility with the highest concentrations of lead and the greatest potential risk to sensitive individuals such as young children and pregnant women pursuant to a *Final Offsite Interim Remedial Measures Work Plan (IRMW; Parsons, 2015a)*. During this period, DTSC also sampled over 1,500 additional residential properties in the PIA.

In February 2016, Governor Brown requested appropriation of \$176.6 million from the state general fund to expedite and expand testing and cleanup of all residential properties, schools, parks, day care centers, and child care facilities within the PIA. Legislation authorizing a \$176.6 million loan for those purposes was passed in April 2016 (AB 118 (Santiago, Statutes of 2016); SB 93 (De León, Statutes of 2016)).

With this funding, DTSC increased sampling in the PIA. Additionally, in partnership with the Los Angeles Trade Technical College (LATTC) and the Labor Occupational Safety and Health program at the University of California Los Angeles (UCLA-LOSH), DTSC established a worker training program called the “Workforce for Environmental Restoration in Communities” (WERC) program. This program provides local people with job skills training in cleanup activities and an opportunity to help restore their communities. A total of 49 community members received training and almost all program graduates

² Stipulation and Order, Docket No. HWCA P3-12/13-010, OAH No. 2013050540.

were hired as sampling technicians by DTSC's sampling contractors. As of June 30, 2017, approximately 9,000 sensitive use properties in the PIA have been sampled.

Under this Cleanup Plan, cleanup of these properties would be determined based on the highest concentrations of lead and greatest potential risk to sensitive individuals. The Cleanup Plan maintains a target cleanup goal of properties with lead sampling results that exceed the representative soil lead concentration of 80 ppm. DTSC estimates that with presently available funding, DTSC can clean up approximately 2,500 of these sensitive land use properties within the PIA with the highest levels of lead and greatest potential health risk to sensitive individuals during this phase of the cleanup.

Initial prioritization for this cleanup phase is based on properties sampled within the PIA prior to June 30, 2017. For each property sampled, the results were statistically analyzed to determine a representative, property-wide lead level that is more health protective than a simple average of results. Using these sampling and analysis criteria for the initial prioritization, the Cleanup Plan provides for the following categories of properties within the PIA to be addressed during this phase of the cleanup:

- Residential properties with a representative soil lead concentration³ of 400 ppm or higher; and
- Residential properties with a representative soil lead concentration of less than 400 ppm, but where any soil sampling result of 1,000 ppm or higher is detected; and
- Daycare and child care centers with a representative soil lead concentration of 80 ppm or higher that have not yet been cleaned up.

All parks and schools that require cleanup will be cleaned up during this phase. In addition, this phase of cleanup may address properties sampled between July 1, 2017, and December 31, 2017, that fall within the above categories.⁴

The Cleanup Plan assumes that sensitive individuals may be present at most properties within the PIA, which is predominantly a residential area. DTSC will identify properties for cleanup based on representative soil lead concentrations. Daycare centers, child care facilities, parks, and schools are particularly sensitive land use properties given the large number of sensitive individuals known to use these properties, particularly young children. There is potential for these sensitive individuals to be exposed to lead-contaminated soil while participating in activities at these properties. Accordingly, DTSC will clean up daycare centers and child care facilities with a representative soil lead concentration of 80 ppm or higher that have not yet been cleaned up. Additionally, all parks and schools that require cleanup will be cleaned up during this phase. DTSC's sampling data as of June 30, 2017, indicate five (5) private schools, two (2) parks, and forty-six (46) daycare centers and child care facilities require cleanup or further assessment. Refer to Sections 2.1.2, 2.1.3 and 2.1.4 for further details.

DTSC will also clean up properties sampled prior to June 30, 2017, with a representative soil lead concentration of 400 ppm or higher. DTSC will determine the representative soil lead concentration by

³ A representative soil lead concentration is determined by the 95 percent upper confidence limit (UCL) of the mean lead concentration in soil.

⁴ DTSC may identify additional properties that have representative soil lead concentrations above DTSC's screening level for lead in residential soils of 80 ppm, but fall outside of the above categories, for cleanup if funding permits.

using the USEPA's ProUCL software. The representative soil lead concentration calculated by USEPA's ProUCL is a conservative and health protective approach that considers all sampling results, including the highest soil lead concentrations. Although higher than DTSC's target cleanup goal of 80 ppm, the cleanup of properties with a representative soil lead concentration of 400 ppm or higher achieves important health protection goals, consistent with other federal and state programs that protect residents from exposure to lead.⁵ DTSC's sampling data as of June 30, 2017, indicate approximately 2,000 properties have representative soil lead concentrations of 400 ppm or higher.

DTSC will also ensure that properties with a representative soil lead concentration of less than 400 ppm, but that also have any soil sampling result of 1,000 ppm or higher that may result in a risk of localized exposure, are cleaned up in a manner that is protective of public health. To address the potential risk for exposure, DTSC will consider several factors, including, but not limited to, the levels of lead in soils largely at or near the surface that may migrate or pose potential exposure to people, especially sensitive individuals. DTSC's sampling data as of June 30, 2017, indicate there are approximately 250 properties meeting this criteria.

Finally, DTSC may clean up additional properties that were sampled from July 1 to December 31, 2017, and that fall within the categories discussed above.⁶

The cleanup objectives address the contaminant of concern (i.e., lead), exposure routes, populations, and acceptable or ranges of acceptable contaminant concentrations for each media of concern. The cleanup objectives reduce or eliminate the potential for ingestion, inhalation, and dermal or direct contact of lead-impacted soil.

As presented in Section 2.0 of this Cleanup Plan, environmental investigations conducted to date have documented the presence of lead in soil at properties throughout much of the PIA. The most likely populations to be exposed to lead in soil at properties within the PIA are the residents and those who frequent parks and schools. The current and future exposure routes to lead include ingestion, inhalation, and dermal contact.

The following cleanup objectives are designed to address the impacts associated with lead-impacted soil at properties within the PIA and reduce or eliminate the potential for exposure:

- Promptly clean up sensitive land use properties in the PIA in a manner that will achieve a cleanup goal that is protective of public health and the environment.

⁵ USEPA uses a representative lead concentration of 400 ppm as a regional screening level for residential lead exposure and to identify residential properties that may require cleanup. In addition, the California Department of Public Health (CDPH) lead abatement certification program standards define "lead-contaminated soil" as soil in children's play areas that contains lead equal to or in excess of 400 ppm, for the purposes of lead-related construction.

⁶ DTSC may identify additional properties that have representative soil lead concentrations above DTSC's screening level for lead in residential soils of 80 ppm, but fall outside of the above categories, for cleanup if funding permits.

- Protect the current and future health of the residential population from exposure to lead in soil that presents an unacceptable risk to sensitive individuals through ingestion, inhalation, and dermal or direct contact.
- Restore disturbed soils to a condition compatible with the existing and reasonably anticipated future land use.
- Minimize the volume of lead-impacted soil to be disposed in a landfill.
- Minimize, to the extent practicable, the need for land use controls.
- Minimize short-term adverse impacts to the residential community due to fugitive dust and soil transport.

DTSC evaluated cleanup technologies, including soil washing, stabilization, and phytoremediation, for their feasibility, applicability to the project, and the need to quickly cleanup lead-impacted soil. Soil washing and stabilization were evaluated as promising technologies for volume reduction and waste minimization, but required a property-specific treatability study to determine if they will successfully remediate lead in soil in the PIA. Based on this evaluation, the following cleanup alternatives were developed:

- **Alternative 1 – No Action.**

DTSC is required by law to evaluate a No Action alternative. This alternative proposes to take “no action,” which means the proposed cleanup would not take place. The environmental effects resulting from taking no action serve as a baseline condition, and effects of the proposed cleanup or an alternative cleanup are compared to this baseline condition.

- **Alternative 2 – Lead Hazard Removal and Offsite Disposal.**

Excavation of soil in six (6)-inch layers until post-remediation exposure concentrations for the property are less than a **representative soil lead concentration of 400 ppm** or a maximum depth of 18 inches is excavated. Soil removed would be disposed of at an offsite facility (i.e., landfill) authorized to manage lead-impacted soil. Properties would be backfilled with clean fill material and covered with surface landscape material (e.g., decomposed granite, mulch, or sod). Soils that are currently covered with hardscape such as concrete, pavement, or other structures would be considered to be isolated from exposure to humans and would not be cleaned up.

- **Alternative 3 – Risk-Based Removal and Offsite Disposal.**

Excavation of soil in six (6)-inch layers until post-remediation exposure concentrations for the property are less than a **representative soil lead concentration of 80 ppm** or a maximum depth of 18 inches is excavated. Soil removed would be disposed of at an offsite facility (i.e., landfill) authorized to manage lead-impacted soil. Properties would be backfilled with clean fill material and covered with surface landscape material (e.g., decomposed granite, mulch, or sod). Soils that are currently covered with hardscape such as concrete, pavement, or other structures would be considered to be isolated from exposure to humans and would not be cleaned up.

DTSC's selection of Alternative 3, the preferred alternative, was informed by CERCLA's nine-criteria analysis in the NCP and removal action selection criteria under the NCP (40 CFR 300.415; see also *Proven Technologies and Remedies Guidance - Remediation of Metals in Soil* (DTSC, 2008). The evaluation of alternatives, contained in Section 5.0 of this Cleanup Plan, identifies Alternative 3 – *Risk- Based Removal and Offsite Disposal* as the selected action. Alternative 3 consists of the following components:

- Securing of necessary permits and access agreements for soil removal and remediation;
- Excavation of soils containing elevated concentrations of lead at properties within the PIA meeting the criteria included in this Cleanup Plan;
- Excavations against houses, garages, outbuildings, driveways, sidewalks, structural perimeter walls, fences, and patios will be benched as necessary, to avoid undermining structures;
- Removal activities will not occur under hardscape, decks, or areas not readily accessible by residents;
- If a planter is not structurally sound, the planter will be removed with the property owner's concurrence;
- Small shrubs and other plantings less than four (4) feet in height (excluding trees and established shrubs) will be removed and disposed offsite with the property owner's concurrence;
- Areas around trees and established shrubs will be excavated to approximately six (6) inches below ground surface within the drip zone to avoid root damage;
- Areas within approximately six (6) inches of underground utilities will not be disturbed to prevent damage to the appurtenances;
- Best management practices (BMPs) will be used to prevent storm water run-on or run-off and to minimize dust generation;
- Project Design Features (PDFs) have been developed for the project and will be used to avoid or minimize impact to the community and the environment (Appendix L);
- Soil will be stockpiled on top of plastic sheeting adjacent to excavation areas and transferred to a haul truck expeditiously. Stockpiles will be maintained in areas that minimize access by and inconvenience to residents. If stockpiles of lead-impacted soil or surface excavations are left overnight, the exposed portion will be covered with plastic to reduce dust emissions. The plastic will be labeled with the contents of the stockpile and signs indicating the contents will be placed adjacent to the stockpile facing the street for passers-by;
- Lead-impacted soil will be disposed of at an appropriately permitted disposal facility (i.e., landfill);
- Confirmation sampling, waste characterization sampling, and air monitoring will be conducted to verify proper implementation of the cleanup activities;
- Confirmation sampling of backfill will be conducted in accordance with DTSC's import fill guidance (DTSC, 2008);
- Site restoration will depend on what top cover the property owner selects (decomposed granite, mulch, sod, or combination thereof) and its relative availability;
- Structural backfill will be placed at depths of six (6) to 18 inches;

- The top six (6) inches of ground surface will include topsoil backfill covered with either mulch decomposed granite, sod, or a combination thereof; and
- Offer to residents the option to relocate while lead-contaminated soil is excavated and removed from their properties and the option to have an interior cleaning by high efficiency particulate air (HEPA) vacuum performed after field activities have been completed.

Following the completion of cleanup activities for each property, the cleanup contractor will prepare and submit a Letter of Completion (LOC) for DTSC's review and approval. Once DTSC approves the LOC, it will be provided to the property owner and tenant, if requested, to document the cleanup activities that were completed at the property. The LOC will provide an overview of the project and may include the following:

- Pre-Excavation Activities: copies of the signed access agreement(s); initial visit evaluation; identification and documentation of the presence of air ducts; documentation of interior cleaning requests; Pro UCL 5.1 (or latest version) output for the property; CDPH Abatement of Lead Hazards Evaluation Notification Form 8551 and Lead Hazard Evaluation Report Form 8552 or later versions; and applicable permits and utility clearances.
- Field Work Documentation: copies of laboratory reports presenting results from XRF field measurements and fixed laboratory analyses of soil samples; figures illustrating work areas and sample locations; photographic chronology of field work; and confirmation sampling results.
- Post-Cleanup and Restoration: Compensation Acknowledgement Forms; backfill compaction results; and Post-Cleanup Evaluation for Lead.

LOCs will be signed and stamped by a Lead Certified Industrial Hygienist and a California-Licensed Civil Engineer.

A schedule for implementation of the preferred cleanup alternative is presented in Section 8.0 of this Cleanup Plan.

A formal public comment period⁷ on the Draft Cleanup Plan, originally scheduled to run from December 15, 2016, through January 31, 2017, was extended in response to requests from stakeholders. The public comment period ran from December 15, 2016 through February 15, 2017. Notice of the public comment period and public meetings on the Draft Cleanup Plan was published in the Eastside Sun newspaper on December 15, 2016. A Public Notice was mailed to the Exide mailing list and sent electronically to those on the Exide Listserv on December 14, 2016, which provided information on how to access the Draft Cleanup Plan as well as links to key technical documents, and information on the three public meetings to be held in the Los Angeles Area.

A second notice was sent on January 8, 2017, to remind the public about the three (3) scheduled public meetings and the locations. A web based portal and email account was established for commenters to

⁷ Public outreach for the Cleanup Plan is described at length in the Final Environmental Impact Report, Section 2.2 *Master Responses to Comments* (Master Response 6). (Appendix L)

provide comments online. Written and verbal comments were also received at the public meetings held on the following dates and locations:

Wednesday, January 11, 2017

Our Lady of Victory Church
1316 S Herbert Avenue
Los Angeles, CA 90023

Thursday, January 19, 2017

Maywood City Council
Chambers
4319 East Slauson Avenue
Maywood, CA 90270

Saturday, January 28, 2017

Boyle Heights Resurrection
Church
3324 Opal Street
Los Angeles, CA 90023